WHTAT IS CLAIMED IS:

1. An optical pickup device for irradiating a data recording layer of a disk type data recording medium with a laser beam emitted from a light source, said optical pickup device comprising:

an object lens comprising a transparent piezoelectric element that deforms when a voltage is applied, and condensing the laser beam emitted from the light source to apply it onto the data recording layer; and

control means for controlling the position of focus of the laser beam by applying a voltage to the object lens to deform the object lens.

2. An optical pickup device as defined in Claim 1, wherein said control means controls the position of focus of the laser beam by applying a voltage to the object lens asymmetrically with respect to the center of the object lens so as to deform the object lens asymmetrically.

3. An optical pickup device as defined in Claim 1, wherein a plurality of transparent electrodes are disposed on the surface of the object lens, and the control means applies a voltage to the object lens through the respective transparent elements.

4. An optical pickup device for irradiating a data recording

layer of a disk type data recording medium with a laser beam emitted from a light source, said optical pickup device comprising:

an object lens that is deformable by a force applied from the outside, and converges the laser beam emitted from the light source to apply it onto the data recording layer;

a piezoelectric element that deforms when a voltage is applied, and then applies a force to the object lens; and

a control means for controlling the position of focus of the laser beam by applying a voltage to the piezoelectric element to deform the piezoelectric element so that the object lens is deformed by a force applied from the deformed piezoelectric element.

5. An optical pickup device as defined in Claim 4, wherein said control means controls the position of focus of the laser beam by applying a voltage to the piezoelectric element so that the object lens is deformed asymmetrically with respect to its center.

6. An optical pickup device as defined in Claim 1 or 4, wherein said control means controls the focal length of the laser beam in the focusing direction.

7. An optical pickup device as defined in Claim 1 or 4, wherein said control means controls the focal direction of the laser beam

in the tracking direction.

8. An optical pickup device as defined in Claim 1 or 4, wherein said control means controls, simultaneously, the focal length of the laser beam in the focusing direction, and the focal direction of the laser beam in the tracking direction.

9. An optical pickup device as defined in Claim 1 or 4 wherein, when a plurality of disk type data recording mediums having data recording layers of different depth positions are employed, said control means controls the position of focus of the laser beam by deforming the object lens so that the laser beam is focused on each of the data recording layers.

10. An optical pickup device as defined in Claim 9, wherein the plural disk type data recording mediums are DVD and CD.

11. An optical pickup device for reproducing signals from a data recording layer of a disk type data recording medium, or reproducing and recording signals from/into the data recording layer, using a laser beam emitted from a light source, said optical pickup device comprising:

a concave reflection mirror as a deformable concave mirror, for reflecting the laser beam;

at least one piezoelectric element for deforming the concave

reflection mirror; and

a piezoelectric element control circuit for controlling the position of focus of the laser beam by applying a voltage to the piezoelectric element to deform the concave reflection mirror.

12. An optical pickup device as defined in Claim 11, wherein plural piezoelectric elements are disposed surrounding the concave reflection mirror.

13. An optical pickup device for reproducing signals from a data recording layer of a disk type data recording medium, or reproducing and recording signals from/into the data recording layer, using a laser beam emitted from a light source, said optical pickup device comprising:

a concave reflection mirror as a deformable concave mirror, comprising;

a concave piezoelectric element,

a conductive coating applied to the inner surface of the piezoelectric element, reflecting the laser beam, and having electrical conductivity, and

plural electrodes disposed on the outer surface of the piezoelectric element; and

a piezoelectric element control circuit for controlling the position of focus of the laser beam by applying voltages between the conductive coating and the plural electrodes to deform the

concave piezoelectric element so that the concave reflection mirror is deformed.

14. An optical pickup device as defined in any of Claims 11 to 13, wherein said piezoelectric element control circuit controls the focal length of the laser beam in the focusing direction.

15. An optical pickup device as defined in any of Claims 11 to 13, wherein said piezoelectric element control circuit controls the focal direction of the laser beam in the tracking direction.

16. An optical pickup device as defined in any of Claims 11 to 13, wherein said piezoelectric element control circuit controls, simultaneously, the focal length of the laser beam in the focusing direction and the focal direction of the laser beam in the tracking direction.

17. An optical pickup device as defined in any of Claim 11 to 13 wherein, when a plurality of disk type data recording mediums having data recording layers of different depth positions are employed, said piezoelectric element control circuit controls the position of focus of the laser beam by deforming the concave reflection mirror so that the laser beam is focused on each of the data recording layers of the respective disk type data recording mediums.

18. An optical pickup device as defined in Claim 17, wherein said plural disk type data recording mediums are DVD and CD.

19. An optical pickup device as defined in any of Claims 11 to 13, wherein the concave reflection mirror is formed as an aggregate of plural concave mirror portions, and generates plural focuses of the laser beam.

20. An optical pickup device as defined in Claim 19, wherein the positions of the plural focuses of the laser beam, which are generated by the concave reflection mirror, are controlled independently.

21. An optical pickup device as defined in Claim 20, wherein the plural focuses of the laser beam, which are generated by the concave reflection mirror, are independently applied onto plural recording tracks on the disk type data recording medium, thereby reading data from the plural recording tracks simultaneously.

22. An optical pickup device as defined in Claim 21 wherein, when a single laser focus is required, only one focus, among the plural focuses of the laser beam to be generated by the concave reflection mirror, is adjusted onto the disk type data recording medium while the other focus is not adjusted onto the disk type

data recording medium.

23. An optical pickup device as defined in any of Claims 19 to 22, wherein said concave reflection mirror reflects a laser beam traveling toward a focal point on the signal recording layer of the disk type data recording medium, and a laser beam reflected at the focal point, by concave mirror portions that are linear-symmetrical or point-symmetrical with respect to the center line or the center point of the concave reflection mirror, respectively.

24. An optical pickup device as defined in any of Claims 19 to 22, wherein the laser beam, which is emitted from the light source and applied to the concave reflection mirror, is a laser beam having a width as large as the diameter of the concave reflection mirror.